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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,832	02/17/2006	Felix Kollmer	HH 307-KFM	4888

10037 7590 01/28/2009

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EXAMINER	
JOHNSTON, PHILLIP A	

ART UNIT	PAPER NUMBER
2881	

MAIL DATE	DELIVERY MODE
01/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,832	KOLLMER ET AL.	
	Examiner	Art Unit	
	PHILLIP A. JOHNSTON	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. This Office Action is submitted in response to the RCE/Amendment filed 12-5-2008, wherein claims 1 and 6 have been amended. Claims 1-7 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,291,820 to Hamza, in view of Schultz, USPN 6,989,528, in further view of Orloff, USPN 4,426,582, and in still further view of Liebl, USPN 3,508,045.

4. Regarding claims 1 and 6, Hamza teaches at Col. 3, line 1-45 the secondary ion-time of flight mass spectrometer 10 shown in Figure 1 below that includes;

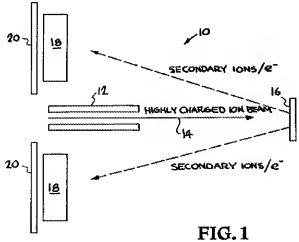

FIG. 1

(a) Measuring secondary ion yield with TOF-SIMS using time-of-flight analyzer 18 for the mass analysis of the secondary ions generated by bombardment of target 16 with primary ion beam 14 as detected by ion detector 20,

(b) The charge, mass, and energy of metal primary ions 14 are selected in ion source 12, which includes an electron beam ion trap (EBIT) with ion extraction optics for directing ions with a specific m/z (mass pure ions) to the target surface. See Col. 3, line 7-16; and Col. 4, line 14-23,

(c) Comparing the secondary ion yield from a target using primary ions with various stages of ionization such as multiply charged gold ions (Au_1^{69+}) versus primary ions of singly charged gold ions (Au_1^{1+}), where the ionized fraction (ionization efficiency) of the sample increases as the charge of the primary ion increases, which enhances sensitivity of SIMS when compared to the use of a singly charged primary ion beam. Col. 3, line 54-65.

Hamza fails to disclose the use of an ion source having various cluster statuses.

Schultz discloses the use of a liquid metal source in a SIMS apparatus that produces a primary beam of selected gold cluster ions. Col. 5, line 45-48.

Schultz modifies Hamza to provide a primary ion beam that includes cluster species (statuses) such as Au_3^+, Au_5^+, and Au_9^+. Col. 5, line 55-60.

Therefore, it would have been obvious to one of ordinary skill that Hamza would use the primary metal cluster ion species of Schultz to measure secondary ion emission with aTOF-SIMS instrument, where the cluster bombardment significantly enhances the molecular ion signal. Col. 5, line 55-67; and Col. 12, line 19-21.

The combination of Hamza and Schultz fails to teach use of an ion source possessing a heatable ion emitter that is coated in the area exposed to the field with a liquid-metal layer that contains an ionizable metal that is emitted and ionized as the primary ion beam, characterized in that the liquid metal layer is essentially comprised of pure metallic Bismuth or of a low-melting-point alloy containing, in essence, Bismuth, wherein the ion emitter is wettable by such pure metallic Bismuth or such Bismuth alloy; wherein a Bismuth ion mixed beam can be emitted by the ion emitter under the influence of an electric field,

Orloff teaches a liquid metal ion source having emitter 11B, which is coated with liquid metal, such as Bismuth, where the liquid metal attains a very intimate, uniform wetting of the material of the emitter. See Col. 4, line 1-14; Col. 6, line 12-31; and Col. 7, line 62-67.

Orloff modifies the combination of Hamza and Schultz to provide a simple drawn tungsten field emitter coated with Bismuth.

Therefore, it would have been obvious to one of ordinary skill that the combination of Hamza and Schultz would use the coated Bismuth coated emitter of Orloff to provide an ion source for producing high current, medium energy Bismuth ion beams. Col. 1, line 12-16.

The combination of Hamza, Schultz and Orloff fails to disclose the newly amended limitation using a mass-pure ion beam of a type Bi_n^{p+} thereby to increase the efficiency of secondary ion production from the sample, relative to bombardment of the sample with Au_1^+ gold ions.

Liebl discloses at Col. 1, line 27-32, bombarding a material to be analyzed with ions to cause the emission of sputtered or secondary ions, from the surface of the material, which

secondary ions may be analyzed to produce a highly sensitive indication of the composition of the material.

Liebl also discloses at Col. 7, line 44-46 that, in order to generate the maximum number of secondary ions, the mass of the primary ions should be as large as possible.

Liebl modifies the combination of Hamza, Schultz and Orloff to provide empirical results that show secondary ion yield is directly proportional to mass of the primary ion and is supported by a theory that secondary ion emission is equivalent to the yield of sputtered particles which increases with the atomic mass of the primary ions and with their energies. For example the best results were obtained by bombarding the sample with Iodine primary ions, the highest mass element shown in Figure 7 below. Col. 7, line 50-70.

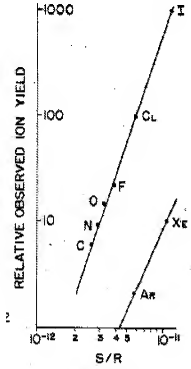

FIG. 7

One of ordinary skill recognizes that Bismuth (Bi) has a higher atomic number than Gold (Au) and thus for the same charge and cluster state Bismuth has a higher mass than Gold.

Therefore it would have been obvious to one of ordinary skill in the art that using a Bi_n^{p+} primary ion beam to increase the efficiency of secondary ion production from a sample, relative to bombardment of the sample with Au_1^+ gold ions as claimed, is no more than the predictable use of prior art elements according to their established functions.

5. Regarding claims 2 and 3, the combination of Hamza, Schultz, Orloff, and Liebl discloses a primary ion beam comprised of essentially identical Bi_n^{p+} ions, and the use of a time-of flight, secondary ion mass spectrometer, as described above regarding claims 1 and 6.

6. Regarding claim 4, the combination of Hamza, Schultz, Orloff, and Liebl discloses a primary ion beam having several milliamps of ion current. See Orloff, Col. 9, line 37-43.

7. Regarding claims 5 and 7, the combination of Hamza, Schultz, Orloff, and Liebl discloses the claimed invention except a liquid metal ion source using a Bi-Pb alloy; however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a Bi-Pb alloy, since it have been held to be within the ordinary skill of worker in the art to select a known material on the basis of its suitability for the intended use. One would have been motivated to use a Bi-Pb alloy for the purpose of providing a source of Bismuth metal having a lower melting point and vapor pressure than pure Bismuth.

Conclusion

8. Any inquiry concerning this communication or earlier communications should be

directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

January 23, 2009

/Phillip A Johnston/

Examiner, Art Unit 2881